——{ 3. Environment }——

3.1 Base Biome
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Description

Presentient **<SPECIES NAME>** evolved in the **<BASE BIOME>** regions of their homeworld. **<BIOME DESCRIPTION>**

3.1 Base Biome

Species evolve and are defined by their environment and their role in its emergent hierarchies. Even after the development of advanced tools allowing for habitat expansion, species are left with the instincts, intuitions, and preferences from millions of years of evolution.

The general habitat of the species determines basic challenges that they face evolutionarily, such as how they traverse the environment, what sources of energy are available, and the temperature and pressure at which they are comfortable. Roll on the *Base Biome Table*, then skip to the appropriate section in this chapter.

Base Biome Table

1d20	Biome	Section
1-2	Atmospheric	3.2
3-11	Terrestrial	3.3
12	Intertidal	3.3
13-14	Subterranean	3.4
15-20	Aquatic	3.5

3.2 Atmospheric Biomes

High in the sky with sparse air and cold temperatures, atmospheric species live their entire lives without touching the ground. To stay afloat on such a sparse medium, they must be lightweight and tend to be small. They are usually very resistant to stellar radiation; however, they may be incredibly vulnerable to changes in pressure. Winged flight becomes inefficient with increasing altitude, so motility may rely instead on convective currents, gas bladders, or other novel methods. Nutrients are also sparse in the atmosphere, so these species tend to toward hyper-efficiency and/or low activity.

Traits: ***Atmospheric, Flying, Size (2d10-5)***

Biome Description

They are found at **<ALTITUDE>** altitudes, with a preference for **<AIR CURRENT>** air currents. They thrive most readily in the atmosphere's **<WEATHER FEATURE>**.

Altitude

Unlike terrestrial biomes, which are generally stratified by latitude, atmospheric layers tend to be relatively uniform. Precipitation, temperature, and environmental features instead shift with distance away from the planet's surface.

Atmospheric Altitude Table

1d100	Altitude	Size	Temp.	Pres.
1-24	Tropospheric	-1	1d3	0
25-46			1d3-3	-1
47-68		-2	1d3-6	-2
69-90			1d3-9	-3
91-92	Stratospheric	-3	1d3-12	-4
93-94			1d3-9	-6
95		-4	1d3-6	-8
96			1d2-4	-10
97-98	Mesospheric	-5	1d10-20	-14
99		-6	1d10-40	-18
100	Thermospheric	-7	1d20*50	-36

> **NOTE:** While temperatures are given for Meso- and Thermospheric altitudes, this holds little relation to what we intuitively understand temperature to be, due to the extremely low atmospheric pressures. For most applications, pressure is by far the more relevant measure of a species' environment.

Tropospheric: The lower atmosphere, containing 75% of its mass and 99% of its aerosols. Most traditionally understood weather effects occur in this region. The troposphere cools with altitude, ending with its coolest region, the tropopause (about 15km up on Earth).

Stratospheric: The lower portion of the "middle atmosphere" comprising about 25% of the atmosphere's overall mass. The stratosphere warms with increasing altitude but is still universally cold, with little air and few nutrients. On earth-like planets, the stratosphere extends from about 15km to 60km above the equator. On earth, this region also contains the ozone layer, which acts as a shield against solar radiation for planet-bound life.

Mesospheric: In the mesosphere, temperature once again decreases with altitude, ending at the mesopause, the absolute coldest part of the atmosphere. On earth, this region is from roughly 60km to 110km above the equator. Above most clouds, the mesosphere still hosts electrical, magnetic, and condensation phenomena. Additionally, meteors typically burn up in the mesosphere and may be a significant source of ablated material.

Thermospheric: In the thermosphere, temperatures once again increase with altitude. Though they can get quite high, the low air density makes the region appear frigid. Air resistance is low enough to allow for orbital craft. This region is home to magnetic phenomena like auroras, feels the greatest effect of atmospheric tides, and is highly influenced by solar activity and radiation. Further, it includes the anacoustic zone, above which molecular interactions are too sparse to effectively carry sound. While meteors pass

through it, air friction is not high enough to cause them to burn. On Earth, this region stretches from 110km to 600km above the equator.

Air Currents

Compared to the surface world, atmospheric biomes are relatively featureless. This means that what features there are tend to have an outsized effect on species development.

Atmospheric Air Current Table

1d20				Current
Trop	**Strat**	**Meso**	**Thermo**	
1-2	1-3	1-4	1-6	Stationary
3-6	4-8	5-10	7-14	Lateral
7-9	9-11	11-14	15-16	Cool
10-15	12-16	15-19	17-18	Warm
16-20	17-20	18-20	19-20	Cyclative

Stationary: The species' home habitat is outside of any prevailing winds, likely at the center of a circular thermal cell. While they are accustomed to occasional shifts in the wind, these are gentle and intermittent, and any currents are locally cyclical.

Lateral: Lateral air flows, at the top and bottom of cyclical thermal cells, provide airflow without significantly warming or cooling the environment.

Cool: These air current at the vertical edges of thermal cells bring cool air down from above (in Tropo- and Mesospheric biomes) or up from below (in the Strato- and Thermosphere). These are generally energy-poor environments, as the currents cool already cold regions.

Warm: Flowing opposite the cool currents on the other vertical edge of thermal cells, these currents cycle warm air either up from below (in the Tropo- and Mesosphere) or from above (in the Strato- and Thermosphere). Warm air can be a valuable source of energy in otherwise energetically poor environments.

Cyclative: Rather than remaining relatively stationary, some species evolve to ride the prevailing thermal winds, experiencing the full cycle of heating and cooling as they follow the currents above their world.

Weather

The atmosphere is not static; air flow, gaseous composition, and electrical activity all change dynamically over time. These phenomena are collectively referred to as weather, and they are a major contributing factor to atmospheric habitat specialization. *Tropospheric* altitudes should roll on the *Tropospheric Weather Table*, while all other altitudes should roll on the *Middle/Upper Atmosphere Weather Table*.

Tropospheric Weather Table

1d20					Feature
Stat	**Later**	**Cool**	**Warm**	**Cycl**	
1-16	1-8	1-12	1-4	1-5	Open Sky
17-18	9-14	13-16	5-12	6-10	Aqueous Clouds
19	15-17	17-18	13-16	11-15	Dust Clouds
20	18-20	19-20	17-20	16-20	Gas Clouds

Middle/Upper Atmosphere Weather Table

1d20			Weather
Strato	**Meso**	**Thermo**	
1-7	1-7	1-13	Open Sky
8-10	8-9	14	Absorptive Layer
11-12	10-13	~	Ablation Clouds
13-18	14-15	~	Condensation Clouds
19-20	16-19	15-16	Electromagnetic Clouds
~	20	17-20	Auroras

Open Sky: The species' preferred habitat is unique in its absolute lack of defining features.

Aqueous Clouds: Typically composed of the species' biological solvent, these clouds are an important part of the planetary rain cycle. Caused by evaporation over large aqueous bodies or evapotranspiration from dense foliage, they rise on warm winds and eventually result in precipitation as temperatures cool. Electrical storms are particularly common in aqueous clouds in warm and lateral airflows.

Dust Clouds: Small particulates kicked into the atmosphere can linger for extended lengths of time and can act as an important source of nutrients and raw materials for atmospherically bound species.

Gas Clouds: Though diffusion usually causes all gases to mix semi-homogeneously, thermal or geological events may cause specific atmospheric regions to differ in air composition than the bulk of the plant. These extra gases may be toxic contaminants or a valuable source of energy and nutrients.

Absorptive Layer: Like the ozone layer of Earth, many life-sustaining planets have some manner of protective atmospheric layer with unique chemical properties somewhere in the middle or upper atmosphere which absorbs dangerous high-energy radiation from the sun.

Ablation Clouds: Meteors approaching the planet begin to burn due to air friction in the upper atmosphere. Even if some of the rock ultimately reaches the surface, much of its ablated material is burned off and lingers in the atmosphere as a potential source of energy and nutrients.

Condensation Clouds: Very little exists outside of a gaseous state in the middle and upper atmosphere, though it is possible for minor shifts in temperature and pressure to cause pockets of condensation to form. While the condensed weight will cause this liquid to immediately start falling toward to surface, these droplets are rich sources of otherwise sparse resources.

Electromagnetic Clouds: Above the atmospheric absorptive layer, stellar radiation creates many highly charged ions. With enough density, they ions can cause spontaneous electrical discharges and may be an important source of energy.

Auroras: High in the atmosphere, the planet's magnetic field interacts with charged particles from the central star to

make dazzling color displays. Charged atmospheric particles from these events can be a valuable source of energy.

3.3 Terrestrial & Intertidal Biomes

Inhabited planets generally teem with surface dwellers who spend most of their time on dry land, including those capable of flight but who nest on the ground or its flora. This is one of the most diverse regions of life due to the environment's variability and abundance of resources. Related to strictly terrestrial species are those who have evolved to inhabit the intertidal regions between the dry land and the ocean.

Both types of species likely required a large moon in orbit around their planet in order to evolve at all. The moon causes tides which are obviously necessary for intertidal species, and as life most likely originated in the ocean and later adapted to land, an intertidal intermediate is generally considered a necessary step toward terrestrial life.

Terrestrial Traits: ***Terrestrial, Size (2d10-5), Walking, Flying +10%, Swimming +20%, Burrowing +5%, Climbing +15%***
Intertidal Traits: ***Terrestrial, Intertidal, Size (2d10-5), Walking, Swimming +75%, Amphibious +25%***

> **NOTE:** *Intertidal* species are generated the same way as *Terrestrial* species with the following exceptions. 1) Instead of rolling on the *Terrestrial Altitude Table*, they are assigned *Basal* altitude. 2) They must roll on the *Intertidal Region Table*.

Biome Description

They thrive at **<TEMPERATURE>** latitudes, making their homes primarily in the **<ALTITUDE>** regions, where **<PRECIPITATION>** conditions have led to emergence of a **<FLORA>** habitat.

Latitude

For most planets, the distance north or south from the equator correlates closely with overall temperature due to the amount of direct sunlight that regions at those latitudes receive. Even for planets with more extreme axial tilts, these general categories can be useful descriptors.

Terrestrial Latitude Table

1d20	Latitude	Temp.	Effect
1	Polar	1d8-8	*Flora* -6
2-3	Subpolar	1d6-3	*Flora* -4
4-6	Boreal	1d4-2	*Flora* -2
7-11	Temperate	1d4	
12-15	Subtropical	1d4+2	*Flora* +1
16-19	Tropical	1d6+4	*Flora* +2
20 +1d4	**Extreme Planetary Conditions**		
1	High Tilt	±(1d12+6)	*Flora* -3
2	Cold Locked	1d10-25	*Flora* -6
3	Band Locked	1d10	
4	Hot Locked	1d10+15	*Flora* -6

Polar: Temperatures at and below freezing year-round, polar areas are harsh environments where food, vegetation, and shelter are typically sparse.
Subpolar: Areas with temperatures below freezing for more than 2/3 of the year. Subpolar regions typically have two seasons.
Boreal: Areas with temperatures below freezing for more for more than 1/3 of the year. Boreal zones may have two to four distinct seasons.
Temperate: Regions in which the temperature drops to freezing for less than 1/3 of the year. These zones typically have four seasons and host a diverse array of life.
Subtropical: Regions which never freeze and reach extreme temperatures (greater than 50% from freezing to boiling) for more than 1/3 of the year. Seasons tend to be a mix of axial tilt and rain cycle.
Tropical: These areas do not freeze and reach extreme temperatures for more than 2/3 of the year. They tend to have seasons determined primarily by the rain cycle.
High Tilt: Regions which oscillate between prolonged heat and cold due to extreme planetary axial tilt. These regions are incredibly hostile but not completely inhospitable to life. Species from planets like this are forced to adapt to extreme shifts in temperature. Roll on the *Terrestrial Extremophile Table*.
Cold Locked: Tidally locked planets feature one side which never sees the light of the sun, and species evolved here gain the ***Aphotic*** trait. This side is universally freezing. Roll on the *Terrestrial Extremophile Table*.
Band Locked: Tidally locked planets feature a small band between the hot and cold sides which hosts temperatures somewhat friendly to life.
Hot Locked: Tidally locked planets feature one side on which the sun never sets. This side is universally scorching hot. Roll on the *Terrestrial Extremophile Table*.

Terrestrial Extremophile Table

1d4	High Tilt	Cold Locked	Hot Locked
1	[5.3] Cyclical Endothermy	[7.0] Insulated	[7.0] Radiative
2	[7.0] Migratory	Size +1d6	Size -1d6
3	[5.7] Burrowing	[5.7] Burrowing	[5.7] Burrowing
4	[5.3] Endothermy; Metabolism +3	[5.4] Hair, Density 1d4+6	[5.3] Circulation +4, Respiration +4

Altitude

Geographic features such as mountains and cliffs are a natural result of plate tectonics. While the difference in heights is nigh imperceptible when viewed globally, minor changes in altitude can have a profound impact on precipitation, temperature, and air pressure.

Terrestrial Altitude Table

1d20	Altitude	*Precip.*	Temp.	Pres.
1-6	Basal	+0	+0	0
7-8	Premontane	-1	-1	0

9-10		-2		
11-12		-3		
13-14	Montane	-4	-2	0
15		-5		
16	Subalpine	-6	-3	-1
17		-7		
18	Alpine	-8	-4	-1
19		-9		
20	Alvar	-10	-5	-2

Basal: The species' habitat is near sea level.
Premontane: The species is comfortable at and above 1000m.
Montane: The species prefers regions above 2000m.
Subalpine: The species is most comfortable above 3000m.
Alpine: The species is evolved for altitudes above 4000m.
Alvar: Altitudes above 5000m are ideal for the species.

Precipitation

The amount of rainfall and overall humidity of the species' natural habitat informs about the types of flora and fauna with which they are familiar.

Terrestrial Precipitation Table (!)

1d20	Precipitation	*Flora*
< 1	Super-arid	-7
2-3	Per-arid	-5
4-6	Arid	-3
7-10	Semi-arid	-1
11-13	Sub-humid	+1
14-16	Humid	+3
17-18	Per-humid	+5
> 19	Super-humid	+7

Super-arid: Regions with less than 125mm of rainfall per year. These are deserts, dry tundra, and tall mountains which have difficultly supporting any life.
Per-arid: Regions with less than 250mm of rainfall per year, such as moist deserts, tundra, and desert scrubland. There is enough rain to support life, but flora is generally sparse and small..
Arid: Regions with less than 500mm of rainfall per year. This amount of precipitation can sustain steppes, grassland, and sparse forests.
Semi-arid: Regions with less than 1000mm of rainfall per year, enough to sustain dry forests or rainy tundra. Low soil quality may still result grass- or shrubland.
Sub-humid: Regions with less than 2000mm of rainfall per year. Given the proper soil quality, forests of large flora can flourish in sub-humid regions.
Humid: Regions with less than 4000mm of rainfall per year. Wet forests, wetlands, and rainforests are common in humid regions.
Per-humid: Regions with less than 8000mm of rainfall per year. Wetlands and rainforest permeate these regions.
Super-humid: Regions with greater than 8000mm of rainfall per year. These regions tend toward being rainforests.

Flora

The type and density of non-sentient, non-motile life. This can inform the species' adaptive behaviors, as it correlates strongly with food and shelter abundance. Most terrestrial flora tends to harness sunlight for energy, resulting in some form of flat, thin photosynthetic foliage. Because they must fight gravity, terrestrial flora of any large size typically relies on rigid support tissues.

Terrestrial Flora Table (!)

1d20	Flora
< 2	Desert
3-7	Grassland
8-11	Shrubland
12-15	Savannah
16-18	Forest
> 19	Jungle

Desert: Mostly rock and sand, perhaps with a few hearty flora, grasses, or lichens.
Grassland: Seas of short flora with occasional bushes or trees.
Shrubland: Grasses interspersed with frequent larger shrubs and occasional trees.
Savannah: Mixed grasses, shrubs, and large flora, sparse enough that the canopy does not close.
Forest: Large flora, packed densely enough to make a nearly solid canopy overhead.
Jungle: Towering and tightly packed flora. Not only do they create a solid canopy, but even the density at ground level can make traversal difficult.

Intertidal Region

The strength of the tides is a good indicator of how widespread intertidal species are, with larger tides making a larger intertidal region and allowing the species to spread itself across more of the planet.

Intertidal Region Table

1d20	Tide Strength	Effect
1-5	Small	Size -3
6-10	Moderate	Size -2
11-15	Large	Size -1
16-20	Expansive	

Small: The tides, whether due to steep terrain or weak tidal pull, rarely shift more than 10 meters inland between their lowest and highest and lowest point.
Moderate: The average inland distance between high and low tides is roughly 100 meters.
Large: These tides routinely shift the coastline by up to 1 kilometer.
Expansive: Usually through a combination of low terrain and strong tidal forces, the average inland distance between high and low tides is 10 kilometers or more.

3.4 Subterranean Biomes

Far below the planet's crust, life may find a way to flourish among the compressed minerals, heat, and dense air of subterranean chasms. These species live a significant distance below the surface and will rarely see (or even know about) the light of day. They are evolved for an environment devoid of light, hot from the planet's internal heat, and heavy with the weight of settled air.

Traits: ***Subterranean, Aphotic, Size (2d10-5)***

Biome Description

They live in the **<DEPTH>** of their planet in the **<OPENNESS>** spaces beneath the crushing weight of the surface, warmed by heat radiating up from the core. Their preferred habitats are underground **<FLORA>** biomes fed by **<MOISTURE>** sources of fluids.

Depth

The depth at which the species typically lives has a large impact on their comfortable temperature and pressure ranges. Those who evolved in the molten interior require unique chemical makeup to survive the intense heat of the core, with only those composed of high temperature *Amalgam Metals* able to thrive in the depths.

Subterranean Depth Table

1d20 Mol	 Amal	Depth	Size	Temp	Pres.
1-20	~ 1-11	Upper Crust	-1	1d20 1d4	1d3-1
~	12-18	Lower Crust	-2	1d6+4	1d2+1
~	19-20	Upper Mantle	-3	1d10+10	1d3+3

Upper Crust: In the upper portions of the crust, temperature first drops as solar heating ceases to penetrate the ground, then rises again with depth due to heat radiated from the planetary core. In the top 5km or so, temperatures are hot but bearable, and the rock is not so compacted to disallow airways or chasms. Frequently, the upper crust does not extend beyond oceanic basins. Species evolved in the upper crust may have natural contact with the planet's surface. On Earth, the upper crust stretches from the surface to about 25km below the surface, and air pressure doubles at about 7km below the surface.

Lower Crust: In the lower portions of the crust, which stretch beneath oceans, temperature increases due to heating from the core until meeting the upper mantle, in which the rock itself becomes elastic from the heat. The temperatures of the lower crust are prohibitive to non-metallic life, and rock is typically tightly compacted. On Earth, the Lower Crust stretches from roughly 25 to 50km below the surface.

Upper Mantle: The elastic upper layers of the mantle sport incredible temperatures, roughly 1250K at its outer edge, and heavy air pressures, but heating from the core is also an abundant source of energy for hearty life utilize. On Earth, the Upper Mantle stretches from about 50 to 650km below the surface, becoming increasingly molten with depth.

> **NOTE:** While estimates of Earth's subterranean layer thicknesses are mentioned, this is highly dependent on the planet having a hot molten core like Earth. It is equally possible, for example, for a planet with a small core to have an Upper Crust which stretches hundreds of kilometers below the surface. Be aware, therefore, that here we have largely correlated Temperature and Pressure. In reality, Temperature is mostly a function of closeness to the core's heat while Pressure is a function of distance from the surface.

Openness

As depth beneath the surface so too does pressure, and the increasing weight of planetary materials compacts them into tighter and tighter conformations. This means that, while species may be able to live in cavernous opening in the upper layers, there are fewer such opening as the depth increases. This can have a profound effect on the species' means of motility.

Subterranean Openness Table

 UC	1d20 LC	 UM	Openness	Mobility
~	1	1-6	Molten	Swimming
1-8	2-10	7-17	Compacted	Walking; Burrowing +60%
9-13	11-16	18-19	Constricted	Walking; Burrowing +40%; *Moisture* +2
14-20	17-20	20	Cavernous	Walking; Burrowing +20%; Climbing +10%; Flying +5%; *Moisture* +4

Molten: The environment is primarily a viscous liquid, with any holes bored by burrowing creatures filled with molten material in short order.

Compacted: The environment is solid and compacted enough that there is little or no open space except those made by creatures burrowing through the ground.

Constricted: Tight passageways and twisting natural tunnels constrict movement but do not limit it entirely.

Cavernous: Natural vaults and chasms somehow resist the incredible pressure of millions of tons of rock above them, offering ample open space for creatures to move about.

Moisture

Access to abundant sources of their biological solvent is necessary for most species to thrive. Unlike overworld biomes which rely heavily on the rain cycle, cramped subterranean spaces are more dependent on streams, rivers, and springs and the resultant condensation from these sources.

Molten regions are considered to have *Abundant* moisture and need not roll on this table.

Subterranean Moisture Table (!)

1d20	Moisture	Effect
≤ 4	Trace	*Flora* -3
5-8	Sparse	*Flora* -1
9-12	Adequate	
13-16	Ample	*Flora* +1; Swimming +5%
≥ 17	Abundant	*Flora* +3; Swimming +10%

Trace: Moisture is a precious commodity in the species' natural habitat, with little more than small rivulets and condensations along the walls.

Sparse: Despite being underground, there are fluid flows, originating either above ground or rising up from deep, high pressure reserves. These flows are weak but consistent, with pools being little more than small ponds.

Adequate: Streams and pools are not difficult to run across, with some of the larger flows being akin to small rivers or lakes.

Ample: Sizeable rivers and lakes exist near the species' preferred habitat, large enough to host diverse ecosystems of their own.

Abundant: There are vast seas near the species' habitat, likely teeming with life.

Flora

Despite the absence of light, subterranean biomes can still foster diverse life, usually fueled instead by thermal, chemical, mechanical, or even radioactive processes. Because photosynthesis does not occur underground and the spaces in which they are growing are often cramped, subterranean flora tend to be more radically different from terrestrial flora than even aquatic flora. Instead of leaves, they may rely on cilia or hair-like structures to harvest mechanical forces or mushroom cap-like protuberances for collecting radiation from buried heavy elements. Regardless of their form, however, their size and density can be described in a similar manner.

Subterranean Flora Table (!)

1d20	Flora
≤ 3	Desert
2-8	Grassland
9-12	Shrubland
13-16	Savannah
17-19	Forest
≥ 20	Jungle

Desert: Mostly cavernous rock, perhaps with a few hearty mushrooms, grasses, or lichens.

Grassland: Seas of short flora with occasional bushes or trees.

Shrubland: Fungal fields interspersed with frequent larger shrubs and occasional larger flora creeping along the passage walls.

Savannah: Mixed fungi, shrubs, and larger flora, sparse enough that despite larger flora clinging to the walls, plenty of the underlying stone is still visible.

Forest: Large flora, packed densely enough to cover the walls entirely, though they leave room for movement through tight passages

Jungle: Massive and tightly packed flora. Not only do they fully cover passage walls, but their sheer density can make any traversal nearby difficult.

3.5 Aquatic Biomes

Aquatic species evolved to live in oceans, lakes, rivers, or other aqueous bodies. These biomes are the usual site for abiogenesis, with plentiful nutrients and energy to develop a teeming biosphere.

Traits: ***Aquatic, Size (2d10-5)***

Biome Description

They make their home in the **<SALINITY>** seas of the homeworld, where they thrive in the **<DEPTH> <FLOOR CLOSENESS>** regions.

Salinity

Most aquatic environments build up contaminants over time, the most common of these being salts. Salt ions can act as desiccants, but due to their relative abundance many species end up evolving uses for them as well.

Aquatic Salinity Table

1d20	Salinity	Effect
1-7	Fresh	*Depth* -2
8	Brackish	*Depth* -1
9-20	Salty	

Fresh: Lakes, streams, and rivers with a relatively low level of ionic contaminants.

Brackish: The junctions between fresh and salty sources see some backflow of salt and other contaminants from the oceanic reservoirs into the rivers which feed them.

Salty: Oceans and large lakes which are the endpoint of fresh runoff become reservoirs of salts and other contaminants which do no evaporate and redistribute with the rain cycle.

Depth

The depth at which an aquatic species evolves is incredibly important as it influences the light levels, temperatures, and pressures to which they are accustomed.

Aquatic Depth Table (!)

1d20	Depth	Size	Temp	Pres	Effect
1-10	Photic	-3	1d8	1d4	*Flora* +2
11-14	Mesal	-2	1d4	1d2+4	*Flora* +1
15-17	Bathyal	-1	1d3	1d2+6	
18-19	Abyssal	+0	1d2	1d3+8	*Flora* -1

20	Hadal	+1	1d2-1	1d8+11	*Flora* -2

Photic: The surface levels through which light penetrates down to 1% of its surface brightness. In water, this can be up to 200 meters in relatively still oceans. This region usually hosts the most expansive ecosphere, due to plentiful energy from the sun. Below this lies the Aphotic Region.

Mesal: This twilight region hosts diverse life, fed energetically from the photic region above. Its upper layers typically include the thermocline, a region in which temperature drops precipitously from sun-warmed photic region. It extends from 1% surface brightness to the point where there is effectively no light. On Earth, this is from about 200 to 1000 meters.

Bathyal: Known as the midnight zone, this region is defined by the absence of light at its upper limit and the slope of the continental shelf – itself a function of oceanic pressure – at the lower limit. With no visible light, fauna must adapt. Low levels of nutrients and temperatures only a few degrees above freezing lead to energetically efficient but slow metabolisms. On Earth, this region extends from about 1000 to 4000 meters.

Abyssal: This region is perpetually dark and cold. With no photosynthesis, chemicals typically converted via floral respiration settle and accumulate, leading to respiratory dead zones – particularly along the sea floor – which can be a death trap for aerobic organisms. Still, nutrients can be found in abundance, as dead organic matter rains down from the higher layers. The upper limit of the Abyssal layer is generally defined by the pressure gradient which effects continental slope, while the lower limit is the sea floor.

Hadal: Deep trenches which extend significantly deeper than the Abyssal shelf. These regions share many of the same properties but often host species uniquely evolved to the even more crushing pressures, temperatures barely above freezing, and toxic chemical gradients. In non-water environments, the lowest Hadal regions may fall below freezing and accumulate large amounts of ice which can be detrimental to flourishing biospheres.

Floor Closeness

The vast oceanic void offers plenty of space for life to develop. However, while life – even intelligent life – may arise in it, most of the resources necessary for developing an advanced civilization lie in the continental shelves and the bottoms of deep oceanic basins. These regions are also the only point of attachment for flora, which play a necessary role in maintaining diverse ecosystems. A species' closeness to the oceanic floor also plays an important role in determining the mobility modes available to it, as walking or climbing are often more energetically favorable than swimming.

Aquatic Floor Closeness Table

1d20	Closeness	Effect
1-5	Pelagic	Swimming
6-7	Vertic	Walking; Swimming +20%
8-12	Demersal	Swimming; Walking +5%
13-18	Benthic	Walking; Burrowing +10%; Swimming +10%
20	Spelic	Walking; Climbing +20%; Swimming +20%

Pelagic: Open ocean or large lake environments, far from solid land of any sort. With no sea floor or walls to host immobile flora, ecosystems tend toward predation.

Vertic: Environments on or near sheer cliff faces. These allow for floral attachment, though their vertical nature means they do not accumulate as many nutrients from dead organisms as they sink. They are, however, a source of raw resources and may house thermal vents which can contribute to thriving ecosystems.

Demersal: The environmental just above the ocean floor or near vertical cliffs. This region can host a range of non-nesting species which interact extensively with the both the open ocean above and the floor below.

Benthic: The sea floor, often nutrient rich from accumulation of dead organic matter which sinks down from high levels. In Photic and Mesal regions, the Benthus host incredibly diverse life, as the presence of sunlight allows for all manner of species to develop.

Spelic: Sea caverns naturally carved into geological formations. These are usually lightless environments with poor circulation. Without strong currents, spelic environments may suffer the effects of chemical entrapment, making dangerous anaerobic dead zones. If they are suitable for life and isolated from other biomes, spelic environments may host wildly divergent evolutionary species from the rest of the planet.

Flora

Aquatic habitats host a wide range of flora, much like their dry-land analogues. While a liquid environment and high pressure may change how those flora appear visually, such as not requiring rigid bodies to resist gravity or having current-capturing cilia instead of photoreceptive leaves, their overall size and density can be classified in much the same way. The most prominent difference is how common microorganismal colonies are, as these tend to take to aquatic environments very well.

Aquatic Flora Table (!)

Pelagic	1d20 V/D/B	Spelic	Flora
$\leq$ 17	$\leq$ 2	$\leq$ 5	Desert
$\geq$ 18	3-6	6-10	Grassland
~	7-10	11-14	Shrubland
~	11-14	15-17	Savannah
~	15-17	18-19	Forest
~	$\geq$ 18	$\geq$ 20	Jungle

Desert: Sparse microorganisms with very little else.

Grassland: Seas of short flora with occasional algal bloom.

Shrubland: Short seaweeds interspersed with frequent larger shrubs and a few larger flora.

Savannah: Mixed seaweeds, shrubs, and larger flora, sparse enough that the canopy does not close.

Forest: Large flora, packed densely enough to make a nearly solid canopy between the benthos and the open ocean above.

Jungle: Towering and tightly packed flora. Not only do they create a solid canopy, but the density on the benthos can make even walking difficult.